Innovation and User Involvement

MNBS 2014 – LAAS, Toulouse, 21&22 October 2014

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Technical Projects Manager
SYMPHONY: Overview

Title
Integrated SYsteM based on PHOTonic Microresonators and Microfluidic Components for rapid detection of toxins in milk and dairy products

Aim
Enable rapid and simple detection of toxins in milk to increase food safety

Why
Aflatoxin M1 is present in milk when feed contaminated with Aflatoxin B1 is consumed. Aflatoxin M1 is a potent carcinogen with European limits set using ALARA principle of 50 ppt and 25 ppt for infant products.

How
Photonics, biochemistry and microfluidics integrated in a miniaturised smart system that will perform low cost label free detection of contaminants in milk

Partners
Fondazione Bruno Kessler; Università degli Studi di Trento; Lionix BV; Epigem Ltd; ACREO Swedish ICT, AB; Consorzio dei Caseifici Sociali Trentini; Quadrachem Laboratories Ltd
SYMPHONY: User Needs & Project Aim

Ultimate Aim

• Invent or develop methods to allow 100% of milk to be screened for the presence of a potent carcinogen as well as toxins and contaminates.

Identifying the user(s) and their needs

• In a market there are many components
• In the Dairy production supply chain there are Farmers, Collection, Dairy Processors, Point of Sale and Consumers
• To identify the user(s) in a market you need to know the market, talk to the market and anticipate where it is going

Know the Market

• SYMPHONY includes 2 partners connecting aims to users
  • CONCAST is an Italian dairy co-operative
  • QCL is a analytical supplier to the dairy industry
SYMPHONY: User Involvement and Review

- **Final User**
- **Sales & Marketing**

- **Project Partners**
- **Stakeholders**
  - Meetings with knowledgeable experts in relevant market

- **Scientific & Technology Community**
- **Market**
  - Final user feedback through questionnaires, other projects, seminars & meetings

- Dissemination through relevant conferences and publications

- First task addressed user needs
- User feedback & partner knowledge collated
- Final device user specifications
- Also address Exploitation aims
- Resulting specifications are challenging but vital for success
- Continuing market feedback throughout project to focus goals
MNBS Fabrication Industry
- Development of MNBS business and manufacturing in EC
  - Microfluidics
  - Photonic Sensor Systems
  - Bio-functionalised Systems
  - MNBS Device Integration
- Promotion of interdisciplinary R&I activities

Industry & Sales
- High market potential for EC and Global sales based on Dairy Industry Need
- Integrating heterogeneous technologies
- Reinforcing European industrial leadership in photonics and MNBS
- Stimulating the innovation of European industry

Final User
- SYMPHONY would provide a UNIQUE solution to milk contamination testing – limited range of techniques available
- Would provide ability to screen all incoming milk - HEALTH
- Explained verbally to endusers in terms of existing dairy lab analysis – Input milk, select test, receive results.

Component Manufacturers

SYMPHONY Manufacturer (Integrator)

Device Manufacture

Market Development

SYMPHONY

Multi-analyte / cross-application development

Market Specific Devices

Market Specific Devices

Market Specific Devices

Market Specific Devices
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<td>Evaluation of market &amp; emerging competition</td>
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<td>Development of modules and demonstration</td>
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Continuous revision of specification and target market to find best exploitation case

Management Board
Steering Committee
Exploitation Committee
**RTD Phase**
- First two years: Research activities.
- Full last year for investigating the scientific and technological challenges needed for the realization and benchmarking of the first SYMPHONY system.
- Establishment of IPR management agreement – Deliverable Task

**Pre-competitive Phase**
- Focus on competitive issues
- Investigate best routes to ensure an organised channel for commercial exploitation.
- Investigate establishment of a spin-off company for the SYMPHONY technology.

**Product To Market**
- Commercial phase & funding to launch products.
- SMEs, including component manufacturing firms, involved in the project will play a crucial role to support the commercial phase.
- Transformative actions will be addressed including development and support of milk safety management plans.
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**Symphony: Road To Exploitation Reasons**

Dairy Analysis / Food Safety

**User**

**Market Drivers**

**Needs**

**Project Stages**

**Regulation**
- Precise and Sensitive Analytical Technique
- Market / National Approvals
- International Approvals (ISO/IFD)

**Cost Sensitive**
- Low Cost per Test
- Fast Testing
- Multi-analyte Testing

**Skill Sets**
- Easy to Use
- Simple to Maintain & Service

**RTD**
- RTD Aim & Premarket Focus
- RTD Aim & Premarket Focus
- RTD Aim & Premarket Focus

**Launch**
- RTD / Ready for Market Target
- Pre-market Focus / Launch Target
Technology Readiness Level

**Project aim to end at TRL5** - Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)

**Product Research, Development & Production Stages**

- **Stage 0**: Start-up organisation
- **Stage 1**: Product definition and concept design
- **Stage 2**: Proof of principle for critical process steps
- **Stage 3**: Concept demonstration
- **Stage 4**: Establishment of manufacturing process
- **Stage 5**: Manufacturing process
- **Stage 6**: Ramp-up Production

**TIME**

**Current Status TLR 3-4**

**Projected 36 Months TLR 5**
1. Project Exploitation Steps
   – IPR / Manufacturing Route / Licensing / Rewards

2. Analysis of Product To Market VALUE CHAIN

   INPUTS
   • Extended Prototyping
   • Manufacturing Components
   • Raw Materials
   • Software

   OPERATIONS
   • Manufacturing Facilities
   • Device Production

   OUTPUTS
   • System Packaging
   • Consumables & Reagents
   • Distribution

   SALES & MARKETING
   • Market Introduction
   • Marketing Media
   • Direct Sales
   • Exhibitions

   SERVICE
   • Hardware
   • Software
   • User Support

SUPPORT ACTIVITIES
Infrastructure / Procurement / Human Resources / Technology Development

3. Value Network Analysis & Business Plan - Month 12, 24 and 36
SYMPHONY: Capital & Time Budget

To Market
Current projections are generic estimates

INPUTS:
- COWIN Information
- FP7 MNBS Project
  LABONFOIL 5 years / €7m
  + Projected 48 months to commercialisation
- QCL associated firm (SIRIUS) develops, designs and produces analytical Pharma systems
International Workshop and Summer School on:

**MNBS and ICT convergence**

*Current Research and Future Trends*

**Chairs**

Pietro Siciliano IMM-CNR  
Leandro Lorenzelli FBK-CMM

Otranto (Lecce, Italy) 1st week of September 2015 *(to be confirmed)*